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IMPROVING THE QUALITY OF IT SERVICES IN COMPUTING CENTERS WITH UNDERSTANDING OF BUSINESS PROCESSES

Dr.-Ing. Robert Scholderer

Consultant

ABSTRACT

Users demand more and more mobile IT-services. Providers need to guarantee the smooth less operation of these required capacities. The transition from a simple computing centre to a value-chained mobile IT-service factory has to be started to guarantee these requirements.

Index Terms – Service Level Agreements, Availability, Monitoring, Reporting

1. INTRODUCTION

The automotive industry showed an ideal way of automatism. But adapting these concepts to the mobile IT business is more than difficult. Several mobile providers offer assembled IT-services to her mobile provider – which are called customer here. Concepts like "IT out of the box" was impeded by the complexity of the underlying systems.

A customer oriented approach is needed. Nonetheless standards do not assure the quality that customers want and don't show a approach to a service oriented IT provision. To find another way can only be done if the status quo is understood. So there is a need to evaluate historical concepts of value-chain and factory issues. Additional new concepts have to be designed to reach the overall goal – quality assurance.

The aim is to run the operation of mobile services more like a factory to improve the quality of the services. Therefore all relevant and existing operational structures must be designed. From this base a model will be developed to create a value-chained service factory. This paper shows approaches and changing concepts to current computer centres with historical structures that have to calculate their resources very tight. The major point is the creation of practical structures of service provisioning.

After a short introduction the approach of value-chained IT-service factories will be presented. The whole process of leading a simple computing centre to a service factory is guided by both the customer point of view and the operational structures. After that concepts and solutions for describing mobile IT services are introduced. By defining these concepts from the customers' point of view the application of these can be easily followed by mobile computing centre. This is also influenced by a technical point of view. Additional indexes show how to parameterize services. They are a key in managing the IT service factory and determining the capacity of the services. Guidelines are provided which define the implementation of the capacity description.

The packaging of mobile services is shown. Things like service catalogues for gold/silver/bronze services, systems of indexes and service level agreements have to be defined for the IT service factory. In particular the conflict between pre-packaged services and customization is analyzed and evaluated. Here ideas for increasing the availability or improving the response time of services are presented.

To ensure the defined capacities the services and the interrelated business processes have to be measured. The next section focuses on measurement methods and the operational aspects of the IT service factory. The infrastructure of the computing centre is a central point for determining where to measure and which constraints have to be taken into account. The actions of the customer have to be analyzed to get a semantic and meaningful measurement.

To help the IT service factory in proving the capacities of the services to the customer different reporting concepts are sketched. These assist the provider in management, technical and legal issues for controlling his computing centre. Customers get a partial view from a reporting portal to enable a smart service meeting about the proving of the capacities.

All these concepts have to be integrated into the work of a computing centre to improve mobile IT services. Therefore the introduction of processes, operational manuals and the determination of responsibilities are key in establishing the transition to the IT service factory. Structures which allow this transition are shown. Individual needs of customers should be prevented. Nonetheless packaged services should have degrees of freedom.

Because of the limited space in this paper we focus on the description of the services and the process model

which handles the requirements which arise from the different structures [1].

2. SETTING

This paper focuses on the interface between the computing centre and its customers. The essential problems which must be solved are the description and the proof of the provided services.

Using SLAs and measurement results for accounting creates the need of bridging the gap between business and IT. The following picture explains the setting which will be discussed in this paper.

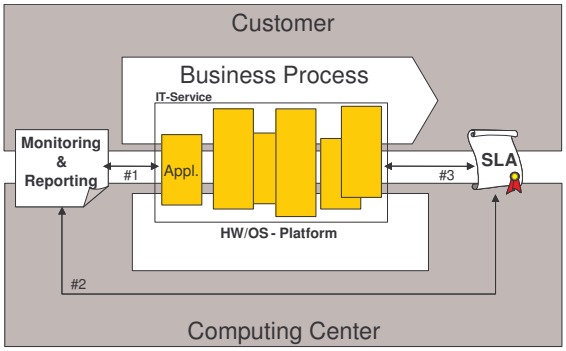

Figure 1 Situation

The customer uses services of one or more computing centers. These services help the customer to make his business processes more efficient.

Most of the applications are determined by SLAs and must be proven, so they can be accounted for. Problems arise from three points:

1. Service Level Agreements demand technical as well as juristic expertise

2. For Monitoring & Reporting it is helpful to understand the technical nature of the measurements as well as the customer's business processes

3: Adequate events are needed, so that the SLAs can report.

Every company should be aware that the agreed maximal succession downtime can be handled. For example, an availability of 99% per year means 3.5 days downtime without violating the SLA. But that's only 7 hours per month.

For the customer the smaller numbers are more meaningful. Another important criteria is the response time which specifies the time between the outage and when it is taken care for. It is important to determine if times like Sundays and public holidays are part of the reaction time or not.

Even if no outages take place the SLA values are necessary for seeing performance problems. In these cases a financial compensation should be agreed upon.
It is important if the service provider is solely responsible for their services or if references exist [2].

2.1. Description of IT-Services

It is our goal to build a concept which can describe the IT services adequately and pragmatically. The problems are illustrated by a small example. The mobile industry and other manufacturing industries show how to build and sell products off the shelf. In these industries trousers are trousers. How can this be transformed to the IT?

Analogies can be found in the hosting and transmission areas, but nowadays applications are handled differently. To provide assembled services these applications must adhere to a scheme.

The following section show which structures have to be built to enable concepts which handle this diversity [3].

3. PROCESS MODEL FOR THE DESCRIPTION OF IT-SERVICES

Every IT company should describe its services in a transparent manner. Many committees define standards which should assist in doing this. The solutions are either very generic like ITIL or only for one target audience like eTOM. A simple coherent concept is important. This concept is explained in the following sections.

3.1. Goal

The process model defines viable structures following the requirements. This model should take care of the business as well as the technical part of the IT service provision. Requirements arise from three areas: technological, business and operational structures.

These are shown in the picture and are discussed in detail in the following sections..

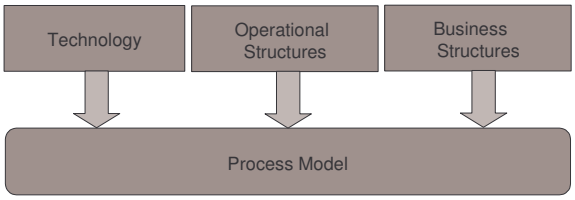

Figure 2 Requirements for the process model

4. REQUIREMENTS

4.1. Requirements coming from existing operational structures

Requirements for the process model arise from operational structures. These structures are built inside the computing centre to guarantee a controlled operation. The controlled operation is particular important for the assembling of services. The process model must present an adequate solution for this problem. The operational structures differ in every IT company even if standards like ITIL are adhered to. On the one hand the process model needs to comply to standards but on the other must be flexible enough to be applied generically. The following requirements should be fulfilled by the process model [4]:

1. Inquiry of the offered IT services: The IT services are partly described in the computing center, i.e. there exist several capability descriptions with different levels. On the other hand some IT services are not documented. Therefore the process model must support the documentation of services so standard can evolve. Both the documented and the undocumented services should be translated in the same manner to a uniform scheme.

2. Formation of the IT services over departments in a company: The formation of IT services is a central requirement in computing centres which are distributed over several locations and have different departments. This comes from the common restructuring of the operational structures. At present every change in the structure of an operation leads to changes in the service description. The formation is in particular necessary to present an uniform interface to the customer. So computing centres can have to improve the efficiency of their operations without causing a loss in the understand ability of the service description.

3. Synchronization of the internal and the customers' view (SLA – OLA): At present internal Operation Level Agreements (OLAs) are not adjusted to the SLAs which are agreed with the customer. The warranty of quality parameters to the customer, i.e. as agreed upon in the SLAs, can only be achieved with the internal services. The requirement which the process model must fulfil is that the internal OLAs must be synchronized with the SLAs, so that a proof of the quality parameters can be done.

4. Calculability / Consistency: From calculability of provision windows, service levels and operation times requirements arise for the service level management and the process model. SLAs are changed continuously and have to be updated frequently. The process model must guarantee the consistency.

5. Maintainability: The operation of computing centres yields requirements for the process model since complex modelling structures cannot and will not be implemented long-lasting. Here two aspects are important. The operation does not allow time consuming documentation procedures and often the specific knowledge cannot be bind to the company. A loss in know-how emerges. So process model has to be maintainable. Only a feasible solution can be implemented.

6. Standardisation of the process of forming agreements: The forming of agreements which are prepared in the computing centre has several criteria's and moments. At different points in time agreements are made which use existing agreements as a base, change existing agreements or are completely new. The standardization does not demand a fixation on a process without a gap but demands that all the aspects belonging to the agreement are considered.

7. Adaptability in case of changes: If innovations like process changes are introduced in a company key indexes can be effected. New key indexes will be made or existing ones will be estimated anew. To hold up a continuous service level management the process model has to adapt these innovations without changing the whole model.

4.2. Requirements from emerging business structures

The requirements which arise from the operation show that this is only one point of view. More requirements come from the management. The business structures should be supported in a way that they allow connections like provider-customer, provider-supplier etc. So the following requirements are important:

1. Combination with additional agreements: Agreements which are juristic binding must have a understandable service description, definitions of concepts and aspects. The process model has to provide objects which can be transformed into those objects.

2. Support of supplier-chains and -nets: The ever more complex becoming business structures in which computing centres buy services from other computing centres and sell their services pose hard requirements. This scenario yield complex service descriptions which must be represented by the process model.

3. Flexibility through customer specific changes: The assembly of IT services is easy in dedicated environments or business areas. The more complex the IT services become, the higher is the probability of differences coming from the customer specific needs. The process model needs to address this, i.e. the assembled services should not change with every customer driven change but should be complemented with proper additions.

4. Support of complex constructs in agreements: Often computing centres are in complex business structures. For example services are bought, own services are outsourced and part services are handed off to the customer in different combinations, with different service levels and characteristics. So a complex and hard to handle situation emerges. The complexity of agreements will be harder to control which causes inconsistencies of the documents. In a model these points must be adhered to so that a transparent view on these constructs and the consistency of the data is guaranteed.

5. Mass Processing: Service Level Agreements are demanded and agreed upon more and more. This situation is aggravated because more and more applications become mission critical and so SLA relevant. The computing centre must administer a huge number of SLAs. The mass processing must be supported by the model.

4.3. Requirements by technical circumstances

The numerous technical systems which are used in computing centres yield new challenges and therefore requirements for the process model [5].

1. Support of the system complexity and diversity: In computing centres heterogeneous technologies are used. A standardized and homogenous technology is rare. So flexible structures must be built which support a system proper and precise description of the IT services but also in a system independent way. This is in particular important for the preparation of outsourcing projects because here only the services but no further details are known. The process model must add here requirements like these.

2. Independent Feasibility on all technology levels: A part of the IT services is determined by several technology levels like systems, applications, databases, enterprise applications. This comes from the fact that customers need the services at different points so get them on different system levels. Further in computing centres different models are used for the understand ability of the system levels. The computing centre needs here support from the process model.

3. Precision of the measurement: The precision which is demanded from the model comes from the area of service measurement. The precision is essential. If the measurement cannot be aligned precisely with the IT services, a uniform reporting is not possible. This leads to a non significant report for the customer.

4.4. Elements of the process model

The process model shown here defines the central objects which are needed for the implementation in a computing centre. The following table shows how these objects arise from the requirements [6].

Category	Requirements
Operational Technological	Inquiry of the offered IT services Formation of the IT services Support for the system complexity
Operational Business Technological	Standardization of the form of contract Combination with additional agreements Flexibility by customer specific changes Feasibility on all technology levels
Operational	Standardization of forming agreements
Business	Support of supplier chains
Operational	Synchronization SLA-OLA Calculability
Operational Business Technological	Maintainability Adaptability in case of changes Support of complex agreement structures Mass processing Precision of the measurement of services

Figure 3 Objects and the requirements from which they arose

1. Service catalogue: The service catalogue defines the services and operational parameters. Here also the concepts and their definitions are included.

2. Service Level Agreement: The service level agreement describes the services capacities which are used for a specific customer.

3. Operation Level Agreement: The Operation Level Agreement guarantees values and processes from the basic operation of the computing centre

4. Underpinning Contracts: External agreements are embedded here in a standardized way.

5. Service Level Calculator: The coordination of all agreements is made by the service level calculator.

6. IT-Master Agreement: The IT master agreement determines several operational processes and the responsibilities.

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